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Technology Transfer Methodologies and Their Consequences for Rural Development[1]

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ABSTRACT

Efficient transfer of agricultural technologies to farmers, which is the principal function of extension services, is a key for rural development. To achieve the objective of technology diffusion, effective technological information delivery methods, which are basically educational, should be found. There is quite a range of educational methods available for individual and group situations, as well as the mass media. With the development of electronics and information technologies, more-sophisticated methods are also emerging. The characteristics, and pros and cons of the various methods commonly adopted by extension services are explained in this paper to enable the selection of suitable technology transfer methods.

Introduction

The primary function of extension (agricultural technology transfer service) is the education of farmers. A substantial number of proven educational methods or techniques exist from which extension workers may choose. They are all intended to set up proper learning situations and to maximize the transfer of information and skills to both young and adult learners. Once the needs of an extension area or target community have been identified, it is the task of extension workers to choose suitable teaching methods that will be most effective in achieving their educational objectives. It is the purpose of this article to identify and explain various teaching methods commonly used in individual and group situations.

People learn better through their own activities, whatever they do. Before choosing a teaching method, the following points should be considered.

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(1) No single method is better than others. The extension worker should choose those techniques best suited to the situation. No one technique is considered superior to another.

(2) Use a number of methods to carry out a program. Experience in extension has shown that the more ways new information is presented, the faster an individual learns.

(3) Methods overlap. It is anticipated that some methods can be used simultaneously for strengthened effects. If a demonstration stimulates group discussion, then different methods can be applied to reinforce the information contained in the demonstration.

(4) Use audio-visual aids and written material whenever possible, as they reinforce and support teaching.

The dissemination of information on agricultural technologies and the stages through which it passes have been called the "diffusion process". It is part of the process of communication, by which an idea gets from its source of origin to the place of ultimate use. It is primarily a description of the mental processes that take place.

There are five clearly defined stages of development.

(1) **Stage 1 (Awareness)**. At this stage, people merely know that an idea exists. They lack details. This is somewhat like seeing something without attaching meaning to it.

(2) **Stage 2 (Interest)**. In this stage, a person seeks more-factual information about an idea. He/She wants know what it is, how it works, and what its potential may be.

(3) **Stage 3 (Evaluation)**. By now, the individual shows a marked interest in the idea as it applies to him/her and his/her operations or family. He/She asks whether he/she can do it, how he/she can do it, or it is better than what he/she is doing now. All these questions flood the mind.

(4) **Stage 4 (Trial)**. By now the individual has weighed the advantages and risks involved, and if the idea is divisible into small segments, is willing to try it on a small scale.

(5) **Stage 5 (Adoption)**. The final stage of the diffusion process is characterized by large-scale and continuous use of the idea. In large measure, there is satisfaction with the practice. These are the stages that extension workers always fulfill by suitable methods of technology delivery for target farmers, as explained below one by one.

Personal Contact

A. Individual techniques

Extension workers, interacting on a one-to-one basis with people, are utilizing an individual method of education. Although this approach is time-consuming, its importance cannot be overlooked, because it is through working individually with clientele that an extension worker learns about the people of the area, how they think, what their needs are, and how they carry on their work. Equally important is the opportunity that individual contact provides to local citizens. They get to know the extension worker, so that a personal bond between the extension worker and the community is established. It is through the use of this method that the extension worker's credibility and integrity can be nurtured. These methods are widely used and have been found to be highly effective when dealing with illiterate farmers working smallholdings who are not normally exposed to other educational techniques.

Method 1: Farm and home visits by extension workers

The farm and home visit method involves meeting individually with a farmer or farm worker at his/her farm or home. A farm and home visit serves a number of purposes: (1) to establish contact with men and women farmers and with others within the farm household, (2) to learn what practices and problems exist on farms and in farm households, and (3) to provide information and assistance. This technique is costly in terms of time spent and the number of clients contacted, which will necessarily be few. However, the benefits are sufficiently great to make this a highly recommended technique. The extension worker should visit many different farms and homes, and care should be exercised to visit with both men and women farm managers as well as other members of the farm family.

An illustration of the effectiveness of the farm and home visit technique occurred in Venezuela. A female extension officer worked with the women of an island village. She walked through the village stopping and talking with the women about everyday matters. As a result of the visits, the extension worker became aware of the daily routine of village life and of the role the women played in the traditional food supply system. She suggested expansion of the gardens traditionally kept by the women for the purpose of selling any additional produce as a commercial venture. When the idea was discussed in informal meetings, the village women asked the extension worker for new seeds and seedlings from which commercial production could be initiated. The potential for improvement in the village economy was made possible through the home visits and informal meetings. The groundwork was also laid for additional extension work, such as teaching better methods of cultivation. As with any educational method, careful planning and preparation should be carried out. The

following procedure is suggested.

<Before the Visit>

(1) Obtain or prepare a community map. A map showing where each family lives or works will assist the worker in planning area visits. In densely populated areas where visits to all clientele are not possible, the location of individuals or families already visited should be marked on the map. The map will enable the extension worker to plan visits efficiently in terms of time and mileage.

(2) Prepare and review the visit record. A visit record should be maintained. It should contain the date each client was visited, and the notes describing the purpose and activities of the visit. When planning a follow-up visit to the client. The visit record should be reviewed to refresh the memory.

If a visit to a new client is planned, the visit record and map should be consulted to learn if prior visits have been made in the vicinity. The review will help define the exact objective to be accomplished by the visit.

(3) Maintain an activity calendar. The extension worker should always plan in advance. Maintaining a list of activities and objectives on a calendar, which can be easily carried, is highly recommended.

<Conducting the visit>

(1) Greet the farmer and members of the farm family upon entering the farm or home and accept any hospitality offered, according to local custom. Spending some time talking with clients is highly recommended.

(2) During the visit, observe the conditions and activities of the farm operations.

(3) Discuss those observations with the farmer. Be careful if it is necessary to criticize something or suggest changes. When offering solutions, discuss what should be done and how the changes can be carried out. If additional information is needed, suggest a return visit.

<Follow-up>

(1) Make notes in the visit record and record the location on the map.

(2) Prepare any additional information for the client. It is essential to fulfill such promises of requested information provision if the extension worker is to build and maintain trust.

(3) Respect the client's privacy, and do not discuss the family's business with others.

Method 2: Office call and inquiries by the farmer

This method is concerned with personal visits made by the clientele to the extension office, to seek information and assistance. A visit to the extension office is a statement of

confidence in the extension worker and his or her advice, and should be handled carefully. To encourage office visits, extension workers should consider the following.

(1) Place the extension office in a convenient location.
(2) Keep regular office hours, so that clients will know when the extension worker will be available.
(3) Provide a visitor's record book, so clients may register their visit and inquiries in cases of the absence of extension workers. The extension worker may contact the visitor at a later time.
(4) Keep the office neat, orderly, and attractive.
(5) Maintain an up-to-date bulletin board and have information materials readily available.
(6) Make a special effort to put the visitor at ease, especially if the individual appears to be shy in an unfamiliar environment. It may be necessary for the extension worker to ask questions in order to determine the visitor's concerns or questions.

Method 3: Informal contacts

Informal contacts are unstructured and/or planned meetings with farmers in an informal setting. Such meetings provide the extension worker with an opportunity to meet clientele in an informal situation, which facilitates the establishment of personal bonds, discussion of problems, and recommendations for solutions. Informal contacts can take place on the street, in the marketplace, or at local celebrations. These meetings often take place by chance and are casual in nature. An effective extension worker is skilful in utilizing such informal teaching situations. The Indian extension offices actively promote informal contact by organizing social days. The purpose of these social days is to encourage extension workers and administrative officers to meet villagers. The informal environment promotes discussion of village programs, and gives extension workers an opportunity to involve villagers in community projects.

Method 4: Model farms/farmers

The model farm/farmer method involves identification of a farmer whose farming methods and personal attitudes are superior, such that his or her operation can serve as a model for others to follow. The purpose of selecting a model farmer is to demonstrate good farming practices by emphasizing an outstanding local example, to persuade neighboring farmers to adopt better farming practices, and to create a learning situation. The model farmer technique will be most effective of course, if the individual involved is well liked and respected, and the observing farmers can follow his or her experiences voluntarily.

Korea has enthusiastically adopted the model farmer technique. The model farmer is chosen by the government to promote local farm initiatives. Once selected, the model farmer receives intensive instruction aimed at fostering a pioneering spirit dedicated to benefiting the

community. The model farmer receives full governmental cooperation and support. In effect, model farmers facilitate extension work by acting as volunteer civil extension workers.

Method 5: Field flags

A final recommendation concerns an individual communication technique to use when farmers are not at home or in their fields when the extension worker visits. This method, which was developed by Korean extension workers, functions as follows. An extension worker visits a farm plot to help the farmer identify plant diseases and harmful insects in a rice paddy. The results of the crop examination and recommendations for treatment, if any, are written down and placed in the pocket of a red vinyl flag that is attached to a thin pole or a stiff wire. The red flag is placed in the field where the farmer can easily find it. After reading the message, the farmer rolls up the flag and places it in the same location. The extension worker recovers the flag on the next trip to the field.

The obvious advantage in using this method is that the time and energy expended by the extension worker in traveling to the farm plot is not wasted, even if the farmer or farm family is not there. The extension worker may go ahead with his/her work, and then proceed with the next task scheduled for that day. As staff time is ordinarily limited, this technique can help the extension worker make more-effective use of his or her time.

B. Group techniques

Group teaching methods are more frequently used in extension work than individual teaching techniques. This is not surprising because an extension worker can reach more people by utilizing group techniques than is possible by following individual methods alone. This is an important factor when time and staff are limited. Group methods are especially effective in persuading the extension service's clientele to try a new idea or practice. A group decision to try a new practice, for example, is likely to carry more weight in an area than a similar decision made by an individual.

One category of group techniques discussed in this section includes the traditional, demonstration-based methods, which have been in many ways the cornerstones of extension work. The methods fall into a grouping which could be informally called "seeing is believing", because they include physical demonstrations of practices the extension worker wishes to promote, or exhibitions of the results of good farming practices. Examples of methods discussed include the methods demonstration, the results demonstration, field days, and field trips. Contests, important in youth-oriented programs, are also discussed. Informative and innovative meetings comprise another important set of group techniques. Types of meeting discussed include the more-traditional lecture, panel, seminar, and symposium in which, for the most part, the audience plays a passive role by listening to one or more presenters. While

this type of meeting can present a large quantity of information to the people attending, audience boredom and lack of participation sometimes hinder learning. To help overcome these problems, the next group of methods, the innovative meeting techniques, was developed. The purpose of the innovative techniques, such as brainstorming and buzz sessions, is to improve the effectiveness of group discussions and to stimulate audience participation. These techniques can be used alone. However, they are often incorporated with more-formal information meetings to enhance interest and learning.

The final set of group methods consists of simulation techniques. These techniques stimulate learning by actively involving the participants in exercises modeled on reality. Individuals using this method look at the society (reality) in which their clientele live. Various elements are selected from that reality, and a simplified model is put together which represents (simulates) that reality. The model, or simulation, can be put into a number of forms such as board games, open-ended scenarios for role playing, and descriptions of life-like situations or critical incidents requiring decisions or answers to problems. The purpose is to provide the participants with experience in real-life situations, which can ultimately lead to a greater understanding of their society and the role they play in it.

Experience can be gained without the real-life penalties exacted if a wrong decision is made. Simulation techniques have been used successfully in rural areas. Simulations were used for 5 years in Ecuador in a rural adult education program, and the methods have also been used in Asia and Africa. Simulation methods rely heavily on the training and ability of the instructor, who must not only choose and/or develop the techniques, but also must handle the discussion following the exercise in such a way that extracts and highlights all the various lessons generated by the exercise.

Some general guidelines on planning and conducting meetings are listed as follows.

(1) **Purpose:** The initial planning step is to identify the purpose of a meeting. Once the purpose has been decided upon, the extension worker should review all information that he or she has at hand about the subject.

(2) **Type:** Choose the type of meeting to best accomplish the purpose.

(3) **Plan:** Once the purpose and type of meeting have been established, planning for the meeting can begin. Such matters as the date, time, place, speaker (if any), publicity, number expected to attend, the desired set up (number of chairs, tables, visual aids, etc.), and how the meeting will be conducted should all be considered. Finally, determine how the meeting shall be evaluated.

(4) **Publicity:** Publicize the meeting well in advance. Include the following in any announcements: subject of the meeting; where, when, and why it is being held; and the speaker's name (if appropriate).

(5) **Holding the meeting:** Bear in mind the following facts; (a) the subject should be of interest to the audience, (b) the meeting should be started with a challenge, (c) ideas should be presented in a logical sequence with ample opportunity for questions and answers, (d) visual aids should be used whenever possible, and (e) after general discussion, a summary should be presented and conclusions drawn.

Method 1: Methods demonstrations

The methods demonstration shows a group or class step-by-step how something is done for the purpose of teaching new techniques and practices to extension clientele. A methods demonstration can show, for example, how to use a tool, a new planting technique to prevent erosion, or how to cook a newly introduced vegetable. Ideally, each individual attending the demonstration will have an opportunity to practice the new skill during the session. Usually, however, time does not permit more than a few to participate. The effectiveness of the demonstration depends, in great part, on the amount of preparation and planning. Because the results of the demonstration can be observed and sometimes practiced, this method is very effective in persuading clientele to try something new. A number of suggestions are given below on how to plan and conduct a methods demonstration.

At the planning stage for the methods demonstration, the following items should preferably be observed.

(1) Identify the problem to be solved. The focus of the demonstration should be on solving a problem that exists locally. A local individual or the extension worker can identify the problem through observations and knowledge of the area. The extension worker should consider involving local clientele in problem identification.

(2) Identify the skill to be taught. Once the problem has been identified, the extension worker must decide what skill to teach, and what educational objectives he or she wishes to attain. When going through the skills identification process, each proposed skill or method should be subjected to the following queries: (a) Is the skill important? (b) Can the people afford to adopt the skill? and (c) Are there sufficient supplies and equipment available to permit its widespread use?

(3) Gather information about the skill and study it thoroughly. The demonstrator (most likely the extension worker) must be familiar enough with the method to break it down into teachable segments.

(4) Involve clientele in the planning and presentation of the demonstration. By seeking the people's advice and assistance, local interest and level of adoption will be increased.

(5) Assemble material required to conduct the demonstration. The material should

include everything the farmer would need to apply the practice on the farm.

(6) Plan the presentation step-by-step, including an introduction and summary.

(7) Rehearse the presentation until it can be given with confidence.

During the demonstration, the following practices need to be observed.

(1) Schedule the demonstration at the most convenient time and place for clients. In some cases this may necessitate two demonstrations, one for men and one woman. In other situations, both men and women may attend the same demonstration if care is taken in scheduling.

(2) Arrange the audience so that everyone can see and hear the demonstration clearly.

(3) Introduce the demonstration by explaining why the new practice is important and what will take place at the gathering.

(4) Ask for assistance from the audience to help in demonstrating the various steps.

(5) Proceed with the demonstration step-by-step, answering questions and repeating difficult steps.

(6) Encourage members of the audience to attempt the new method during the meeting. If time allows, each individual should have an opportunity to practice the skill.

(7) Summarize the importance of the skill, the steps, and the supplies and equipment needed. Distribute illustrated literature, if available, showing each step.

(8) Evaluate the demonstration carefully, noting where the strengths and weaknesses appeared.

(9) Visit those clients who indicated an interest in the demonstration.

Method 2: Results demonstrations

The results demonstration teaches why a practice or input should be adopted by physically showing how a new or different practice compares with a commonly used local practice. This technique is often used in crop farming. The purpose of using the results demonstration is to prove that the new practice is superior the one currently being used, to persuade extension clientele to try the new practice, and to set up a long-term teaching situation.

An example of a results demonstration would be a comparison of two wheat crops, one with an application of fertilizer and one without. In cooperation with a farmer, two demonstration plots can be laid out in a field, side-by-side. In one, wheat is planted using local seed and local cultivation practices. Because the purpose of the project is to demonstrate the effect of using fertilizer, no fertilizer is used. In the second plot, wheat is also planted, and subjected to the same practices and conditions, but fertilizer is applied. Both crops are harvested at the same time. If all goes well, the fertilized plot will produce a substantially greater yield than the unfertilized plot, visibly demonstrating the tangible benefits of fertilizer

application.

A successful demonstration can produce positive results for extension workers by creating confidence in their judgment and ability. It is a technique extension workers new to an area might want to use to establish themselves in the community. The extension workers should consider the consequences if the new technique fails, however, and choose the demonstration carefully. A results demonstration is costly in terms of time, but if it is successful, it is an effective way to promote a new practice locally, and can open the way for further interactions with the clientele. The results demonstration requires careful and detailed planning to be successful and to obtain full educational benefits. The following suggestions may serve as a guide when planning to use this method.

At the planning of the demonstration:

(1) Identify the problem to be solved by the demonstration.

(2) Decide upon the objectives to be accomplished.

(3) Gather complete information about the proposed practice and study it thoroughly.

(4) Seek the assistance of the clientele in planning and carrying out the demonstration. Endorsement by local leaders will lend credence to the effort. Seek their recommendations about good possible host farmers.

(5) Develop a complete plan of work, clearly delineating each individual step and showing who has responsibility for each task.

(6) Select accessible demonstration plots that are centrally located and near a road so people can easily visit the site.

(7) Visit the host farmer and work with him or her to make sure that he or she understands the purpose of the demonstration and how it will be implemented. This step is essential because the host farmer will be answering most of the questions about the project, and will play a prominent and visible role during the entire project.

During the demonstration:

(1) Ask area leaders to cooperate in encouraging people to attend the start of the demonstration.

(2) Visit the demonstration site often.

(3) Use the demonstration site for meetings and tours during the life of the demonstration. Encourage the host farmer to describe the process.

(4) Keep records on both sites so the results at harvest may be compared. Detailed records maintained during the entire span of the demonstration will facilitate speaking about the process in meetings and elsewhere.

(5) Publicize the demonstration by the best methods available. Use newspapers and radio if available. If not, talk about the demonstration on market day, to informal contacts, and in meetings held for other purposes.

After the demonstration:

(1) Evaluate the process and results of the demonstration. This will be useful when using the method in the future.

(2) Provide follow-up information and training to interested clientele.

Method 3: Contests

Contests are based upon the principle of competition and community-oriented activities, in order to encourage participation and heighten practical agricultural skills. The purpose of holding contests is to provide farmers, especially young farmers, with powerful motivational forces and to offer opportunities to excel in specialized subjects and skill areas.

After periods of learning and practice in a community, individuals and teams demonstrate their proficiencies and talents before the public in contests involving such skills as crop and livestock judging, tractor driving, and weed identification, to name but a few. Offering awards and rewards encourages entering contests, shows, exhibits, and demonstrations. Extension workers assume coaching roles. These include offering instruction in the fundamentals of the contest and suggesting strategies for winning. Coaching implies total involvement. It requires many hours, special kinds of resource materials, practice sessions, and extra travel to attend the competitive events. Preparation for contests causes coaches and farmers to become a team with a close relationship.

Method 4: Field trips

During a field trip, a group travels to another location to observe agricultural practices, projects, or demonstrations not available locally. The trip may consist of one or more stops. The purpose of the field trip is (1) to provide first-hand observation of practices that might be of benefit to the farmer, householder, or farm worker; (2) to enable the group to interact with individuals knowledgeable about the practices; and (3) to present a fresh and different learning environment for both the extension worker and the clientele.

The destination of a field trip may be an agricultural experimental station, a farm, a home, or a community organization, such as a women's marketing cooperative. It is essential that the extension worker work with the group beforehand so they know what they are going to see, why it is important, and how much time they will have at each stop. If the host is going to discuss certain practices, make sure he or she clearly understands the objectives of the visit, what role the visit will play in the overall educational program, and the time available for the visit. It is also recommended that the extension worker assign a task to the group to be completed during the trip. For example, each group member could be given a few questions relevant to the visit site to answer. Finally, time should be set aside for a group discussion at the end of the trip. This will provide the leader with an opportunity to highlight important aspects of the experience, and give the group members a chance to compare notes and ask

questions.

Planning a successful field trip takes a great deal of time and trouble. However, it is one of the most effective teaching methods, combining, as it does, discussion, study, demonstration, and first-hand experience in real-life situations. The field trip can be a very effective tool in persuading clientele to try a new practice. Some suggestions in planning a field trip are given in the section below.

(1) Identify the objective of the trip. A field trip taken only to add variety to teaching methods will be of little value, and a waste of time and effort.
(2) Set aside adequate time to plan the trip. The trip necessitates coordination of many factors such as people and transportation, over long distances, and with limited time. Allow enough time to complete all the necessary tasks.
(3) Contact site operators to obtain permission to visit. Identification of hosts and destinations may be decided upon with assistance from local leaders.
(4) Secure transportation. Decide early in the planning process how many people to plan for, what kind of transportation will be used, and whether it will be available for the dates in mind.
(5) Draw up a tentative schedule. Work with local area leaders to: (a) make out a timetable, (b) decide who will go on the trip (farmers, farm workers, and local leaders), and (c) learn what they believe should be gained from the trip.
(6) Finalize a detailed schedule and assign tasks to each participant. Steps (1) to (6) should be completed early in the planning period.
(7) Coordinate with site hosts to be sure that everyone clearly understands the time of arrival, the number of visitors, the purpose of trip, and their own role.
(8) Make a 'dry run' to ensure that the proposed itinerary can be completed in the allotted time.
(9) During the trip, keep groups moving to maintain interest and keep to the timetable. Provide for the comfort of the group to the greatest possible degree.

Method 5: Field days

A field day is a day or days on which an area containing successful farming or other practices is open for people to visit. Exhibits of a related nature such as tools, seed samples, and educational material are often displayed. The purpose of the field day is to permit extension clientele to personally observe and ask about successful farming practices, and to create a situation in which informal contacts and learning can take place.

Field days are normally held once or twice a year, usually in each crop season. They are held on farms, at experimental stations, or at government centers to demonstrate successful farming techniques or research. This method helps promote better farming by putting the best

agricultural exhibits on display, transmitting research results, and providing an opportunity for farmers to see and discuss the demonstrations with one another and with technical specialists. Exhibits and displays add another dimension to the experience. If the field day is held on a farm, it is recommended that the host farmer play a prominent role in discussing crops and practices. The extension worker should be available to clarify technical points. The following section contains some suggestions for planning and holding field days.

1) Planning a field day

(1) Identify the objective to be achieved.
(2) Select a demonstration site.
(3) Work with area leaders and the host farmer to decide on a date and on essential details of the event.
(4) Publicize the field day well in advance.
(5) Display signboards at the field day site.
(6) Arrange for an exhibition of related materials of interest to visitors. Where possible, include items that can be carried away by those attending.
(7) Arrange for transportation to carry the farmers and other visitors around the site. As with the field trip, arrange this well in advance.

2) Holding the field day

(1) Distribute literature describing the farming practices being demonstrated.
(2) Take visiting farmers around the plot. Conducted tours not only show consideration to visitors, but will help ensure they see the important points of the demonstrations.
(3) Let the host farmer explain the practices being demonstrated. This will show appreciation to the farmer for his or her extra efforts, as well as making visiting farmers feel more comfortable about asking questions.
(4) Emphasize distinctive features of the crops and/or practices being shown.
(5) Hold group discussions with participants about the practices being shown. Record their comments and reactions for use in the subsequent evaluation, and in planning future field days. Comments can be especially valuable in identifying what is, or is not, acceptable to the farming community.

3) Follow-up

(1) Evaluate the field day to determine its success or failure. Use the evaluation to help guide future field days and program planning.
(2) Contact farmers who indicated interest in the new practices and assist them in adopting it on their farms.

Method 6: Informal discussions

Informal discussions in small groups are another type of group technique. Neighbors get together in a certain house at a certain time period once a month, or perhaps once a week, to consider and communicate common public problems and to get acquainted with their neighbors, exchange farming information and ideas, and share common problems, in order to help each other and the community.

An informal discussion can be carried out at the villagers' monthly meeting. This discussion group cannot have professional leadership. The idea is that responsible villagers should get together to consider and talk about common problems. It is most successful in its pure form of government-assisted village and town work in developing countries, where the extension worker helps the community improve not only its own economic literacy levels, but also health, sanitation, and family planning. Through this type of discussion, extension workers can encourage grass-roots discussion of pubic issues, improve the quality of discussion, and form a common thought pattern.

Method 7: Lectures

Lectures are formal, verbal presentations by a single speaker to a group of listeners. Visual aids may illustrate the lecture, and a question and answer period may follow the talk. The purpose of the lecture is to provide a body of organized information to an audience. While the lecture is a systematic way to present information, a major drawback is the passive role of the listeners. Unless the speaker is gifted not only in his or her grasp of the subject matter but also in wit and style, attention tends to wander. Lecturers should be well organized, deal with one or two central themes, and make every attempt to obtain and keep the attention of the audience. High-quality visual aids are often useful. A lecture series, with lectures being presented over a period of time, can sometimes be used.

Method 8: Panels

Panels are moderated meetings in which a limited number of experts or specialists give short presentations on the same subject. Ideally, each panelist represents a different field or discipline.

A panel provides a group with a series of informed opinions on a given topic. Those attending a panel session have an opportunity to receive an in-depth view of a subject by hearing the various experts give their opinions, by observing the interplay among the panelists, and by having an opportunity to question them. A strong moderator should guide a panel with a gift for summation, to ensure that each panelist has enough time to give his or her presentation, and to oversee the question and answer period.

Method 9: Colloquies

This is a modified version of the panel, in which three or four resource people discuss a specific topic. The audience can express opinions, raise issues, and ask questions. The primary difference between a panel and colloquy is the degree of audience participation.

Method 10: Symposiums

Symposiums are meetings in which two to five resource people give short, prepared papers on a given topic. Interaction with the audience is not expected. The symposium is used primarily for information gathering at the professional level.

Method 11: Seminars

Seminars are comprised of a small group of students or trainees engaged in specialized study under the leadership of an expert. The leader may give a brief, opening presentation, often on provocative issues, and guides general discussion. Members of the seminar sometimes conduct research. The seminar is normally reserved for advanced study and provides an opportunity for in-depth study of an issue or a series of issues with an expert.

Method 12: Modified conference method

This method is a procedure in which a group of people, each of whom has some experience in connection with the job or problem at hand, comes together to discuss situations they are facing. This method provides those attending with an opportunity for constructive thinking under the stimulus of contributions offered by other participants.

Steps in the conference procedure are as follows.

(1) Define the job or problem under consideration.

(2) Analyze the job or problem.

(3) Select the functioning facts from the experiences given by members of the class.

(4) Assemble these functioning facts either on a blackboard or a chart.

(5) Evaluate the facts obtained in light of the problem.

(6) Submit any additional facts to be considered, such as data from experimental stations.

(7) Have each member of the group make a decision concerning the changes, if any, he or she can perform on their farm.

(8) Have definite working plans prepared for implementing the desired, improved farming practices.

(9) Supervise the making of plans. At a later date, visit each farm to check the results.

Method 13: Clinics

Clinics are meetings or series of meetings involving the analysis and treatment of specific problems. This method gives participants an opportunity to examine a problem or problems, with the goal of finding a solution. Those attending are also exposed to a process of analytical problem solving.

Method 14: Workshops

Workshops are cooperative gatherings of individuals who discuss, learn, and apply practical skills. Participants are trained in skills, procedures, or practices, which can be immediately utilized. Those attending are expected to produce a product, such as a visual aid, by the end of the meeting. The workshop normally involves between 15 and 30 people. Workshops can be a very effective teaching tool because the participants spend one or more days intensively working on a specific product. When properly conducted, this method gives practical hand-on experience, and is a widely used technique.

Method 15: Brainstorming

Brainstorming is a group discussion technique in which members generate as many ideas as possible on a specific topic without restraint or consideration of practical applications. Spontaneity and creativity are important parts of the process. The purpose of utilizing this technique is to promote group creativity, so that all aspects of a problem are considered. Input from each member is encouraged with the intention of a better product or solution being produced than might have been possible by an individual. Brainstorming gatherings should be restricted to fewer than 20 people per group. As ideas are presented, a recorder should write them down so everyone can see them. No judgment is made about the ideas during the session. Evaluation is made at a later session.

Method 16: Buzz sessions

This technique involves dividing a large group into much smaller ones, in which a topic is discussed within a limited period of time. Generally, buzz groups are expected to produce a product (such as a list of ideas, an opinion, or a group of questions) within about 5 min and to give an oral report to all groups involved in the exercise or meeting. The purpose of the buzz session is to facilitate the involvement of every member attending the meeting. This method is sometimes used to break up a larger meeting, and to add variety and interest. It can also be used to solicit solutions to problems, or to gather opinions.

Method 17: Discussion groups

Discussion groups are meetings or conversations between two or more people discussing a topic of mutual concern. Members of a group normally share a common

background, based on assigned readings or shared educational experiences. The purpose of this technique is to provide members of a group with an opportunity to gain a firmer grasp upon knowledge by setting up a situation in which questions, problems, and feelings about a topic can be discussed. Discussion is a versatile technique in that the group can assign a moderator, be given goals, or have an agenda to follow. To be a true discussion group, one of these elements must be presented to provide structure.

Method 18: Listening teams

Listening teams consist of individuals within a group who listen, take notes, form questions, or summarize a meeting such as a lecture, panel, or a colloquy. The purpose of the listening team is to facilitate interaction between a speaker and the audience. This technique is especially useful when the speaker is not knowledgeable about a group's or institutions specific problems.

Method 19: Simulation games

Simulation games are learning exercises in the form of games, which contain elements of real-life situations. Their purpose is to provide participants practice in dealing with real-life situations, in making decisions about them, and in observing and understanding any consequences of those decisions. The exercise seeks to promote discussion about a participant's own reality.

An example of a simulation game is "Shantytown", which was developed to model the situation facing recent rural immigrants to a city. The game can be played by two to six people. Each player is given a certain amount of money at the start. Play takes place on a board made with areas such as rent, salary, employment, food, bar, and other factors, which direct the player's actions upon landing on the area. Dice, cards (marked with instructions and consequences), and tokens are used.

As play proceeds, the dice are cast, and the players advance around the board encountering various circumstances, for example, "buy food", "pay rent", "go to jail", "employment", and so forth. The game is over when all but one (or all) players are forced to return to their village. The game is designed to inform rural people of factors they may never have considered when thinking about leaving their village. For example, the need to pay for housing and food needs may have been fulfilled without the use of cash in their village. A game like "Shantytown" opens up many points for discussion, and gives players opportunities to face real problems.

It is important to understand the culture or society before initiating game playing, because what is permissible on one culture, such as gambling, may not be so in another. Once a game has been chosen or put together, play it a few times and change it, if necessary.

Flexibility is important. Should a game need to be adapted, involve the clientele?

Method 20: Role-playing

Role-playing is a simulation in which a simple, open-ended scenario is described, and participants are assigned roles within the situation or problem to act out. There is no script to follow, and participants play the roles as they see fit, drawing on their own experiences. The purpose of using this technique is to involve participants in real-life situations, to stimulate thought and learning, and to encourage discussion about factors involved in the drama.

The scenario used to set up a role-playing exercise may be simple, but it must be based on the local reality. In planning this exercise, the extension worker should (1) identify a setting, for example the landlord's estate, (2) identify and assign roles, describing each to the players (for example, the landlord, two tenant farmers), and (3) specify a task or problem to be solved. For example, the tenant farmers are trying to convince the landlord to help them buy a new high-yield seed to increase production. Special emphasis should be put on the discussion following the exercise, and in helping the audience and the actors themselves to assess the points raised by the drama.

Method 21: Critical incidents

Critical incidents are an open-ended simulation technique in which each participant gives his or her own opinion about the outcome of a described situation. As in all the simulation techniques, the incident should be based on the local reality. In this exercise, a number of incidents can be used to promote discussion in which proposed solutions can be compared and discussed.

Method 22: Community training centers

While a school or village hall may be used for instructional purposes, the community will gain a sense of purpose and achievement if it undertakes to build a simple building of its own for use as a training center. It can be improved upon in the course of time, and it will help the extension worker if he/she has a small fund from which to purchase materials such as nails, cement, and fittings.

Method 23: Remote conferences

To hold important meetings among a disparate audience, there are three technologies available nowadays, even though they require expensive high-tech equipment: tele-conferencing, Web-conferencing (using the Internet to share files while talking on the phone), and video-conferencing (which can be combined in various ways with the other two).

None of the technologies is as good as race-to-face encounters, especially when the meeting crosses cultures, borders, languages, and time zones (in other words, when a

meeting is global). Yet when travel is not an option, one technology may work better than another for specific kinds of meetings.

Therefore, treat each technology as having a different kind of business use or purpose. If the extension worker cannot get the group of farmers together in person, he should run the meeting in a way that recognizes the limitations of conferencing technology.

As these technologies require heavy investment in IT facilities and equipment, users should make sure their investments are put to good, effective use. Therefore it is necessary to recognize where remote conferences, when conducted correctly, are genuinely more effective than the in-person alternatives.

Web-conferences were less effective than tele-conferences a few years back. Now, Web-conferencing technology has taken over with the rapid development of Internet technologies. Internet communication has become cheaper than telecommunication. Web-conferencing is optimal when a meeting is basically in the form of a broadcast, where one person does most of the talking, but there may be a few questions from listeners. The technology is also effective when the speaker works from a document such as a report or a PowerPoint presentation.

For global meetings, web-conferencing surpasses tele-conferencing for broadcasting purposes because differences in language or time zones are exacerbated with tele-conferences. With a shared document, the meeting can be more inclusive for a longer period of time. Conversely, if tele-conferencing is used for broadcasting, the meeting should accordingly be shortened.

To facilitate communication, there are three rules of thumb for using these technologies in a more-nuanced way.

(1) The more broadcasting there is in a meeting, the more appropriate tele-conferencing or web-conferencing is. But do not expect the broadcast to be as effective as in-person encounters.
(2) Conferencing technologies put a greater strain on participants, so make video-conferences or Web-conferences shorter than corresponding meetings would be, and involve fewer people.
(3) Do not expect any technology to substitute for travel. Remote participants in a Web-conference cannot take away from the encounter what they would if they were meeting in person.

There are times when a meeting demands real interaction, and video-conferencing is a viable solution. But be forewarned that the technology leaves a lot to be desired, particularly when an international crowd is involved. If using video-conferencing purely as a substitute for

an in-person meeting, everyone is forced to put in the same amount of time, and even more attention, than they would have put into a regular meeting. Video-conferencing works better when only a few people are involved and when the meetings do not have much formal structure. In essence, video-conferencing is fine when used by two people with Web cameras having a short conference, but it falls short when used by 20 people from three countries in an all-day marathon session.

The most important principle as far as suitable behavior in video-conferencing is to act as if you were in the same room as the speaker. Remember that the attendees might be seen as being much larger than life, because at some sites a person's image appears on a very large screen. Therefore courteous behavior should be observed at all times during a video-conferencing lecture or meeting, both to the speaker and participants at other sites. When the lecture is in progress, it is normally best to mute the other sites, so that any noises made do not interrupt the speaker, and then turn on the sound again when answering questions or otherwise participating in discussions. While remote conferencing technology can satisfy some global communication needs, accept the fact that the best way is to meet in person.

Mass Communication

Personal, face-to-face methods cannot reach everyone who wants and needs information. Such mass media methods as radio, newspapers, magazines, television, motion pictures, slide shows, exhibits, printed materials, and computers are used to reach large numbers of people quickly.

These methods are particularly useful in making large numbers of people aware of new ideas and practices, or in alerting them to sudden emergencies. While the amount of detailed information that can be transmitted by some mass media is limited, they can serve important and valuable functions in stimulating farmers' interest in new ideas. Once stimulated or made aware through mass media, farmers will seek additional information from neighbors, friends, extension workers, or progressive farmers in the area.

Some mass communication techniques that may be developed as part of a campaign to support other extension efforts are discussed below. They may be used singly or in combination, as needed, to meet the proposed objectives.

A. Print media

The term, print media, is used to cover those communication techniques that rely

principally on combinations of printed words and pictures. They are our oldest formal combination. To use them effectively the educational level and literacy rate of the audience must be considered.

Extension programs can take broad and creative approaches to ways in which to use print methods for conveying news to specific audiences. Newspapers may come to mind first, but they are only one of several types of printed mass media available to convey extension news and information.

The following points should be considered when preparing printed materials.

(1) When preparing printed materials, keep the audience constantly in mind. Write with words people understand. Write about things that interest people. Change the method of presentation as the proposed readership changes (young people, farmers, and women). Eliminate difficult scientific and technical terms where possible.

(2) The importance of illustrations cannot be overemphasized. Even where literacy is not a problem, people interpret words differently because of differences in past experience. Almost every extension service overestimates the ability of its audience to read a printed message and understand it clearly. Almost every extension service overestimates the extent which people will be attracted to and read a printed massage.

(3) Illustrations reduce the risk of misunderstandings: they help make your message clear and more attractive, and they increase learning.

(4) A good layout arranges material in a logical, easy-to-follow manner and makes it attractive to readers.

(5) Realistic illustrations are usually the most effective in extension work, although humorous drawings have a definite place. Use humor carefully so as not offend anyone. Good pictures make any publication easier to understand and more interesting to read, but crop unnecessary details from photographs, and keep drawings simple.

(6) Folders generally have more appeal when color or ink other than black is used. Choose colors that are legible as well as appropriate: dark green ink for pastures, dark brown for soils, etc. Two or more colors can be used if the extra cost is justified. Colored paper can also be used for interesting effects and is available at very little extra cost.

(7) Attractive, effective publications can be prepared on spirit duplicators, mimeograph machines, offset duplicators, or letterpresses. It is not difficult to train an artist to produce illustrations, headings, or even copy in the local dialect for each of these methods of printing.

(8) Recognize that the cover of the illustrated literature has a function different from the

pages within. The cover should be attractive, colorful, and impelling. The audience should feel an urge to look inside. A bulletin that never reaches the correct hands cannot possibly reach the brain where judgments and decisions are made.

Method 1: Newspapers

Newspapers vary greatly in their audiences and coverage, from large urban daily newspapers to small community papers. They are published by governmental, private, and other organizations (sometimes including extension services) and can provide valuable channels for extension news.

How can one get news accepted and used by newspapers? Mainly by knowing what editors want and by being able to judge the news-worthiness of your information. Here are six ingredients that newspaper editors often use to determine what they print and how they use it.

(1) **Timeliness:** The more timely the information, the greater its news value is.

(2) **Nearness:** The closer the information seems to readers (geographically and psychologically), the greater its news value is. That is, local newspapers prefer local news.

(3) **Consequences:** The more those readers are affected by the information, the greater its news value is.

(4) **Prominence:** Prominent people, places, and things possess greater news value.

(5) **Human interest:** Readers are attracted to human-interest topics such as unusualness, conflict, progress, emotions, and others.

(6) **Newspaper policy:** Newspapers have editorial policies that influence the kinds and amounts of information they publish. So the use of various kinds of extension information may vary from paper to paper or by period, based on editorial policies.

Here are some of the main kinds of articles that extension workers can submit to newspapers.

(1) **Advance articles on an event**: These include announcements of approaching extension meetings, tours, speeches, or other extension events. Such articles are often brief, but should include details that would permit a reader to attend if interested, i.e., the date, starting time, location, sponsor, and nature of the event, as well as the agenda and possibly the name of a contact person who can answer further questions.

(2) **Follow-up articles on an event:** These reports to readers about recent meetings, tours, speeches, or other extension events. Their main purpose is to report results, so they are often longer than advance articles on an event. They should include the date, location, sponsor, and nature of the event, to provide a background for the reader, but the greatest emphasis should be placed upon the outcome of the

specific event. For example, an article about a speech should report what the speaker said. An article about a field tour should summarize what the participants saw and heard. An article about a business meeting should summarize the decisions that were made.

(3) **Information articles:** These are widely used in extension work to provide helpful information of various kinds, such as timely advice, "how-to" descriptions, reports of research findings, market news, relevant statistics, etc. They might not be directly tied to an event.

(4) **Feature articles:** These are informational and sometimes involve news, but they are distinct in several ways from the types of articles mentioned earlier. Feature articles often interpret the news and provide background for readers. Often they are intended to entertain or inspire as much as to inform. They may feature ideas, places, techniques, persons, organizations, goals, successes, challenges, and almost any other aspect of human activity. They often involve more human interest contents than do news or information articles.

(5) **News-writing style and format:** News-writing styles differ throughout the world, so the best approach is to use the styles and formats that local news editors prefer. Work closely with local editors to learn their style rules, deadlines, and other preferences.

Regardless of specific requirements, editors probably want news copy that is neat, readable, and well-spaced on the page. They probably prefer writing that is clear, simple, active, and concise, because such writing permits easy reading, which is your primary goal. They also want copy that is accurate. One of your most successful techniques may be to keep the readers in your mind as you write.

Method 2: Wall newspapers

Wall newspapers are used successfully by extension services in many countries. The wall newspaper is known for being a pictorial, using drawings and/or photographs, with a text as brief and vivid as possible. It is similar in size and appearance to a poster, but often contains more written material and a wider variety of information. For example, a typical extension wall newspaper might use pictures and text to (1) announce the appointment of a new livestock specialist, (2) give a progress report on a current fertilizer campaign, (3) urge the use of vaccine to prevent fowl cholera in poultry flocks, or (4) report on results of experiments with new grain varieties.

In most countries where wall newspapers are used in extension programs, they are produced in quantity by a central office and distributed by mail or through the extension organization. Some wall newspapers are printed by letterpress or offset methods, but

methods such as silkscreen printing also work. Distribution varies according to the requirements of each country. Mailings may be made directly to village leaders, schoolteachers, religious leaders, and others. Sometimes a local extension worker hand-delivers, and even posts or issues the paper. Walls of buildings at busy intersections are excellent posting places. Papers also may be posted effectively on village bulletin boards, in reading centers, in schools, and inside public buildings.

Method 3: Blackboard news

Actually, extension workers need no typesetting or duplicating equipment to reach mass audiences with print news at the local level. Chalk and a blackboard, or a felt-tip pen, or crayon with a newsprint pad, can provide a valuable kind of wall newspaper. In the absence of plain newsprint sheets, extension workers in India have even made hand-printed news in large print over classified advertising pages of discarded newspapers. The classified advertising provides a suitably neutral background for readable, hand-written extension news posted in the village.

Method 4: Newsletters

Newsletters can be an effective, low-cost way to reach readers. The content of a newsletter can be more-localized and specialized than is possible with a general newspaper. Like the wall newspaper, the newsletter is well adapted to the use of local languages and dialects. Also, a newsletter can include hand-written, typewritten, or typeset copy. Duplication methods can also greatly vary.

A newsletter usually contains a larger share of text to visuals than does a wall newspaper, but not necessarily. Page size is smaller than for newspapers, so space is often limited and brevity is vital.

In fact, brevity is one of the benefits that readers find attractive about newsletters. Newsletter writers try to get into each subject quickly, and use short sentences and energetic words. The newsletter can more-selectively be directed to a target audience than newspapers. For example, a newsletter might be distributed only to new mothers in a village; content could provide news and advice about feeding and caring for infants. The newsletter can, therefore, be newsy, localized, and specialized in what it covers.

Extension personnel might publish their own newsletter, or newsletters, or they often submit news to newsletters published by other organizations, such as cooperatives, that reach readers with interest in extension services.

Method 5: Folders, leaflets, and pamphlets

Simple folders, leaflets, and pamphlets can be used in many ways in extension programs. They may be used singly, for example to explain the advantages of a soil test. They may be used in a series of broader subjects like swine rising, with separate leaflets on feeding, housing, and breeding. They may be used as reminders of when to plant crops or what chemicals to use to control different insects.

Folders, leaflets, and pamphlets may also be used in coordination with other visual methods in long-range campaigns. Because of their low cost, they can be given away at meetings and fairs, and offered on radio programs. They are useful to supplement larger publications when new information is available and when reprinting of the entire publication is not practical. An experimental campaign is being conducted in the Northwest Frontier Province of Pakistan by dropping timely one-page leaflets which discuss insect pests and vegetable growing practices from spray planes in village areas.

In addition to the advantages of low costs and short preparation times, folders, leaflets, and pamphlets take less time to get their message across. Their smaller size makes it necessary for the author to eliminate non-essentials from the message.

Method 6: Fact sheets

Fact sheets are "boiled-down" treatments of subject matter. They usually cover a single topic, and often they are limited to a single page. Most fact sheets are illustrated with drawings, photographs, or both. The illustrations are used to show details or steps in a process, to make the information clearer and more understandable. One of the important uses for fact sheets is to provide current subject matter to field workers. Field workers often complain that needed technical information is slow in reaching them. Much agricultural information is carried in technical bulletins and other lengthy publications. These take considerable time to process and distribute.

On the other hand, the essential facts can be written down and combined with drawings and/or photographs to make an effective summary that can be reproduced quickly and inexpensively in the form of a fact sheet. This puts current information into the hands of local extension workers, providing better service to farm families. Extension administrators who are concerned with the problem of speeding up intra-staff communication of subject matter should study the advantages offered by fact sheets.

B. Audiovisual media

The communication methods that rely on the audio or visual senses, either alone or in combination, help overcome the barrier of illiteracy and offer special advantages. The most

common forms of integrated audiovisual media are televisions and computers with a speaker, while simple audio media include radios and cassette tape recorders/players.

Method 1: Radio

Radio can be one of the most useful mass communication tools for extension workers, for several reasons. It offers immediacy, as radio programming can be changed quickly to meet new conditions. It reaches large numbers of people, especially as transistor radios become more widely used. It permits listeners to take their radios wherever they go, even where electrical power is not available. Radio provides the warmth of the human voice. It can tie into strong oral traditions of communities and overcome literacy barriers that face print media.

Extension workers find that radio works most successfully at the local level, to communicate local problems, solutions, and activities. They use local names, voices, and activities in programming. Farmer success stories and other kinds of neighbor-teach-neighbor approaches have been found to work well. Radio is most effective at the awareness and interest stages of the adoption process.

However, listeners cannot refer back to what they have heard on the radio, nor can they see what is being described. So radio is limited in its ability to convey detailed, complex information and, used alone, is limited as a teaching method. Also, televisions and computers are rapidly replacing radios as a better audiovisual communication means with the increasing economic wealth of the developing and developed world.

Two types of broadcast radio are commonly used for extension programs.

(1) **Open broadcasts:** Extension workers provide programs for the station's broadcasts, such as spot announcements to be taped and repeated at intervals throughout the day, or longer programs, presented in person or taped for use on scheduled programs. Stations also invite printed news releases that can be read in newscasts and other programs.

(2) **Group-listening to open broadcasts:** Extension services in many countries use approaches commonly called listening clubs, radio schools, or farm forums.

Local participants gather at a certain time, listen to a program broadcast by a certain station, and then discuss the program in terms of their own situations. Organized group listening can produce good results because it more closely involves listeners than individual listening does. However, listening groups are difficult to maintain and may require more of the extension worker's time than can be justified. Instead of organizing an extension listening group, it may be possible to promote collective listening in existing groups, such as cooperatives or farmer's associations. If an extension office wishes to organize its own group,

it might be created for a limited period, perhaps keyed to a timely topic that is important to local listeners. When the series of broadcasts ends, the group disbands.

In general, group listening declines as transistor radios become more widely used by individuals and families. In some communities, participants in a radio group listen individually to the specified broadcast, and then discuss the program at a later meeting. As radio ownership grows in local communities, it seems likely that extension workers will use listening groups mainly for major topics that can arouse widespread local interest.

Here are some tips for preparing and presenting radio programs for broadcast.

(1) Try to localize the content and match it to the interests of listeners. Emphasize local matters and involve local people.

(2) Take advantage of the timeliness of radio by emphasizing current activities, trends, issues, developments, and so on.

(3) Use sounds in creative ways. The voice is one kind of sound, but you can use many other kinds effectively.

(4) Attract the listener's attention quickly, through a compelling remark, catchy introductory sound, or other technique. The first 10 seconds of a program are especially important.

(5) Give information in a flowing manner that makes it personal and easy to follow. Good radio copy is written for the ear and uses simple, understandable words. Test your radio copy by reading it aloud and revising it until it reads easily and flows smoothly.

(6) Speak in a normal conversational voice, at a natural speed. Speak as if you were conversing with one person. Sound interested.

(7) Use changes of pace in your presentation to hold interest. You can do so by varying your reading speed, for example, or by varying the kinds and volumes of sound.

(8) Repeat important facts, such as dates, times and places of meetings. Listeners cannot refer back, as they can with printed material, so they must rely on you to repeat important information.

(9) Invite listeners to take part. You can involve them mentally by asking questions, posing problems, and otherwise encouraging interaction as if you were in conversation. You can even involve them physically, sometimes, by inviting them to carry out certain actions as you speak.

Method 2: Audiocassette recorders/players

Low-cost, battery-powered cassette recorders permit extension workers to use recorders in some effective new ways. A radio listening group can record its reactions, conclusions, questions, and suggestions about a given program or topic, then send the cassette to the station or sponsoring organization for information and follow-up. A regional or

central extension office can produce and record instructional programs on audiocassettes for use at local levels. Such cassettes might be used in group meetings or made available for individual listening. Local listeners can, in turn, record their own reactions or questions on cassettes, which are returned to the regional or central extension office as valuable feedback. A local extension worker can make field recordings for use in group meetings. The recorded material can add interest to meetings, yet is simple and cheap to produce.

Cassettes can permit multiple use of information aired on broadcasts, by simply recording a program as it is aired. The resulting recorded program can be used later in group meetings. Conversely, the remarks of a guest speaker at a meeting can be recorded, and perhaps used in a later broadcast.

Method 3: Television

Two types of television media are available for teaching purposes. The first and most familiar is broadcast television, in which programs are aired over a large geographical area. The second type is sometimes referred to as closed-circuit television. This usage takes a video signal from a tape or cassette and carries it over a cable to one or more monitors. The monitors may be in several locations or next to the video player.

Broadcast television offers exciting possibilities for extension workers. The agricultural officer can demonstrate as well as talk. He can present useful method demonstrations as well as show a whole series of result demonstrations through pictures, which show changes over time. All types of visual aids such as charts, graphs, live objects, and blackboards can be used to increase teaching effectiveness with television.

However, caution should be exercised before launching into the use of television. Television programs require meticulous preparation. Every piece of equipment must be in place, and the dialogue must be well thought out. Most importantly, study the geographical area that the transmitting station covers. Secondly, determine the number of receivers that are available to the intended audiences. It is useless to program for rural audiences if they do not have the necessary receiving equipment or they live outside the range of the transmitter.

Organization is an essential ingredient of a television program. The method used to arrange the sequence of related words and pictures that make up the story is called a "run down sheet". This sheet is divided into two columns, one headed “video” for pictures, the other for “audio”, which contain an outline of what is to be said. The run down sheet is not a script but an outline to guide the television crew as well as the performers. Start using this medium with programs with all the action in one place. Then test out the ability of extension personnel to perform more-involved sequences as experience is gained.

The basic rules are simple. Move deliberately to allow the camera to follow. Operate

within a small area. Hold any material steadily on target for camera viewing. Avoid the use of complicated demonstration material. Time the presentation before going to the studio to make sure the program fits into the allotted time. Have some extra points ready to present in case the material runs short. Color combinations and light contrasts are important. The television engineer can specify which combinations are the best.

In spite of the relatively high cost of receiving sets, television occupies an increasingly important role in developing countries. Many governments have installed sets in each village so villagers can receive official broadcasts. Extension administrators have only to convince authorities of the value of their educational broadcasts to open up this useful channel of communication and education to the mass of people.

Method 4: Instructional television

Instructional television can be an excellent tool for extension workers. Instructional television is distinguished from broadcast television in that materials are not designed for distribution by the mass approach of broadcasting. Productions need not be tied to specific time constraints of broadcast requirements and can be as specific in length as needed. The medium of instructional television had its beginning in cable television, with programs distributed from a central source to outlets in various centers, such as classrooms or conference rooms. With the advent of new formats of videotape such as 3/4" U-Matic, 1/2" Beta, and 1/2" VHS, the possibilities of using instructional videotapes or television have expanded dramatically. These systems feature color images and can produce programs with lightweight portable equipment powered from battery sources. These videotapes can then be edited in production centers and duplicated to provide current materials for extension leaders and officers. This gives immediacy to a medium for transmitting information in times such as an insect or disease emergency. The ability to prepare timely topics in the field using identifiable farmers as subject matter carries an enormous credibility factor. Videotapes can be stored for use at later dates or erased and reused when the subject matter is no longer timely.

Another value of this medium is as a training tool for extension workers enrolled in "in-service" education courses or refresher courses. Workers can be videotaped in presentation sessions, and the tapes viewed to help individuals evaluate their own delivery styles, their presentation strengths and weaknesses.

Videotapes can be mailed, sent by messenger, or carried by extension personnel to wherever extension audiences may be located. A video-player and a television receiver or monitor is needed for delivery. These units can be powered by batteries, provided the right selections of equipment are made. Viewing stations should preferably have access to main power.

Videotape technology is the most expensive of all of the mass media methods. Users should be aware of this fact and financing and maintenance must be adequately provided for before adopting the technique. Personnel who plan to use the equipment will need to receive adequate training. The basic rules for planning and production of broadcast television also apply to the production of materials for instructional television.

Method 5: Computers

Computer technology is developing at light speed. One of the most useful teaching means using the computers is CAI, which also can be applied to farmers' education on any agricultural subject.

The term "CAI", computer-aided (or assisted) instruction, refers to any use of computers that interacts students in any way in the educational process. The major benefits of CAI are as follows.

(1) CAI allows students to practice procedures as long as required to achieve defined competencies. This helps level the ground where students bring a wide range of native skills and educational backgrounds to a classroom. Students with a strong desire to learn the subject can succeed even with weak backgrounds when given the right learning tools and a supportive environment.

(2) Immediate feedback provided by CAI saves time and prevents learning the "wrong" concepts. In traditional training, students can do a number of problems entirely wrong on a homework assignment. The student would not be aware of his/her misconceptions until the teacher grades the homework. Then, the student has to not only learn the proper procedures but "unlearn" the wrong procedures as well.

(3) With CAI, students can determine their own weaknesses and concentrate efforts on overcoming those weaknesses before moving on to more-advanced concepts.

(4) Good CAI materials reward students immediately for correct responses and behaviors. This encourages students to confidently move on to more-complex concepts. CAI can make learning interesting and exciting.

(5) A small but nevertheless important benefit of good CAI material is the on-line immediate evaluation and grading of a student's work. Very few instructors and professors will miss the hours of mindlessly correcting and scoring student homework. More importantly, this aspect of CAI leaves the instructor more time to work with students on an individual basis. All aspects being considered, CAI does not necessarily replace teachers, textbooks, classrooms, or laboratories. CAI is another aspect of training that harnesses the computer and makes it a tireless participant in the educational process. Perhaps the greatest benefit of CAI is that it can give marginal students that small boost which leads to success.

Typical CAI material is comprised of the following items.

(1) **Tutorials:** Tutorials are self-instructional programs or documents that present lessons on the computer screen in some combination of text and graphics. The quality and effectiveness of tutorials are highly variable. A key element in effectiveness is the level and quality of interactivity required of the learner. Some tutorials appear very attractive on the surface while requiring the learner to do almost nothing.

Pretty graphics and carefully composed text is often developed with the buyer rather than the learner in mind. Students will quickly become bored and lose attention if the interaction required is weak or nonexistent. Some tutorials have interactivity that is limited to right or left arrows that only allow students to turn pages. Good interactivity should be more complex than an occasional multiple-choice question with a fixed answer. Another quality indicator in tutorials is intelligent loops and branches based on learner behavior. Good, highly interactive tutorials are expensive.

Tutorials require reasonable reading comprehension, self-discipline, and long attention spans to succeed.

(2) **Drills and practice:** In subjects that require students to learn many complicated procedures, drill and practice CAI programs can be highly effective. The ability of a computerized program to compose many variants of a problem can be used to expose students to greater variety than is possible using textbooks alone. The immediate correction and grading is, without question, highly motivational to students. When carefully constructed, drill and practice programs can present students with challenges rather than chores. The motivational and learning value of immediately seeing "CORRECT!" appear on the computer screen after working a complex problem is enormous. Drill and practice CAI programs can be used to good advantage to reinforce procedures and processes taught in the classroom/textbook or through a computer-based tutorial. Good drill and practice CAI should use a random generator to create a spectrum of variations of each problem/situation presented to learners to make repeating a lesson worthwhile. To the extent possible, good drill and practice material should measure not only on a correct/incorrect basis but time on task or other meaningful measures of accomplishment.

(3) **Simulations:** Simulation CAI programs can be a very powerful tool for teaching the operation of complex systems. Obtaining an instant answer to a "what if" question can generate interest and a "feel" for how a thing operates not readily possible through physical analysis. Good simulation programs do have a learning curve.

Student must spend some time learning to operate and interact with simulation programs which are often not as intuitive as tutorial programs and drill and practice

programs. Simulation programs generally combine systems design and training tools. Therefore, a supervisor must design activities into his/her course situations and involve the simulation program in a useful instructional fashion.

A few CAI programs combine simulation with drill and practice to produce easy-to-use virtual reality that can be measured, tested, and repaired on the computer screen. The choice of CAI software by a specific training program depends on many factors beyond the analysis of general benefits and projected positive outcomes. The instructor's teaching style and opinions must be taken into consideration when possible. Instructors rarely use instructional materials unless they personally feel that the material has educational merit. A teacher who believes strongly in the value of a training aid, CAI or otherwise, will tend to work vigorously to obtain good results from the material. Student opinions often reflect teacher assessments of the value of instructional aids, CAI or otherwise. Cost is also a driving force in many instances. The cost of adding CAI to a training program can be as little as a few dollars per student, or up to $10,000 or more per training station. The less-expensive CAI materials are supplemental training software programs that reinforce the existing classroom/textbook/laboratory training.

Another form utilizing computers in education is Internet technology. As the information age opens up with splendid development of related technologies and economic affluence develops such that many can afford high-technology systems, the Internet through computers has changed life. Few people 20 years ago could have foreseen the possibility that online training would remove extension workers from having close contact with farmers. Nor did many people 20 years ago think that e-mail might one day serve as a substitute for long-distance phone calls. A complete overview of what the Internet has to offer education is beyond the scope of this overview. The Internet holds endless possibilities for economic reforms, capitalized learning environments, and current, more-accessible information than we could possibly hope to attain within the confines of traditional education. The combining of cultures and societies from around the globe, due to communication via the Internet, offers exciting possibilities for greater problem solving and reinventing the way that we teach and learn.

With these benefits of the Internet, we can further explore some of the trends in technological education. In the 21st century, students and teachers will prefer "on-demand", virtual learning to traditional school programs. This trend will influence the way information is transferred, as well as how information is retained. More-interactive lessons and greater learner input will personalize and internalize knowledge better, through kinesthetic, audio, and visual involvement. Books generally take from 3 to 5 years to print and publish before readers receive them. In the future, many books and useful information will be online, on

compact disks or digital video disks, allowing information to be more current and more easily updated with greater cost efficiency.

Virtual education will accelerate learning through interactive multimedia resources, networking via the Internet, interactive television, satellites, and other technologies. These media will dominate the preferences of the masses. The Internet will enable students to take a greater interest in developing the way they learn best. The most-informal learning experiences on the Internet are just as valid as formal courses. These can be serendipitous findings or accidental learning. Some of the best learning experiences have been the result of linking to a web site through hypertext navigation, surfing, or succumbing to the temptation provided when a search retrieves seemingly unrelated results. To succeed as an online facilitator, one has to possess certain skills, knowledge, and competencies.

Most importantly, he/she should know how to use conferencing software and how to facilitate the learning process in an online environment. Online facilitation can have different meanings. At some sites, the term means asynchronous communication such as discussion forums, electronic bulletin boards (BBSs), and e-groups. Online facilitators for electronic bulletin boards and forums act as moderators reviewing contributors' messages offline and posting administrative messages. Online facilitators of synchronous events work in real time often dealing with technical problems, while keeping a discussion moving in the right direction and at the right pace.

Regardless of the mode of delivery, an online facilitator of resources needs to focus on the following three main topics.

(1) **Role of the online facilitator:** The Australian National Training Authority (ANTA) compared the role of the online facilitator with the role of a teacher, as "online facilitation changes the role of the teacher – from that of information provider and teacher to that of a coach, an orchestrator of resources and a leader and guide in the learning process". Although online course facilitators and teachers alike play a variety of roles, facilitators using the online medium can divide roles among several people. This is certainly the case with conferencing software. Having someone to deal with technical problems behind the scenes allows the facilitator to concentrate on his role as coach, leader, or guide.

(2) **Online facilitator skills and competencies:** According to ANTA's *Conceptual Model of Influences on Online Teaching and Learning*, the competencies required of online facilitators to ensure an effective online learning environment include the following aspects. (a) Instructional: questioning, supporting, leading and pacing, and providing explanations and additional resources, induction programs, the establishment and maintenance of learning communities, group tutorials, and

individual feedback. (b) Managerial: keeping to the task, agenda, timetable, procedural rules, and decision-making norms and tracking student participation. (c) Social: creating a friendly social environment in which a climate of learning is promoted. (d) Technical: participants need to be comfortable with the system and the software in use. These competencies are not much different from the competencies of a classroom instructor. However, facilitators of online learning environments consistently report that greater cognitive effort, a wider range and depth of skills, and more time are required for effective facilitation. An elegantly designed learning environment can collapse and have less impact if the facilitator does not have the range of skills to engage earners and support them as they develop their own learning systems.

According to the ANTA study, there are several characteristics of the synchronous learning environment that challenge facilitators.

(1) The lack of non-verbal cues. Communication is more open to misinterpretation, and feedback requires more thought.
(2) Increased expectation from learners that instant technology means instant feedback. Learners are less tolerant of communication delays.
(3) An increase in one-to-one communication. Facilitators need to customize responses to individual inquiries. However, some facilitators establish a bank of Frequently Asked Questions (FAQs) to handle repetitive questions.
(4) More knowledge, thought, and effort are put into pacing, leading, questioning, and encouragement.

What strategies should online facilitators use? Here are some practical tips.

(1) Participate before you facilitate.
(2) Be an advocate for the virtual classroom within your organization.
(3) Practice, practice, and practice.
(4) Learn the technology well.
(5) Keep tuned in to participants.
(6) Record questions that are asked in the session's chat function.
(7) Use a teaching assistant.

Method 6: Other teaching means

Extension organizations are experimenting with other mass communications systems, many of them related to computers. Some examples of these are listed below.

(1) **Videotex:** A two-way interactive system that links computer databases to television sets, through telephone or cable television lines. Agricultural uses of Videotex are

being tested in many countries, including the UK, France, Germany, Denmark, the Netherlands, Canada, and the US.

(2) **Broadcast teletext:** A one-way, non-interactive system that transmits text and graphics through broadcast signals to television sets with special decoders. Teletext had been developed in more than 15 countries.

(3) **Slow-scan television:** This system makes picture communications possible through channels such as telephones, satellites, microwaves, and FM radio. Slow-scan television is being used in the South Pacific and other areas.

(4) **Communications satellites:** This system offers special potential for reaching remote areas. Agricultural uses of satellites are being tested in India, Peru, Indonesia, the Pacific nations, Canada, Alaska, Colombia, and the USSR, for example.

C. Projected visuals

Another group in the audio-visual category is projected visuals, such as motion pictures, slides, filmstrips, and overhead transparencies. They have much appeal, and are among the most effective of the visual leaching aids. It is as well to remember that they have important limitations as well as advantages. The main advantages of each type of projected visual are discussed in the sections that follow.

But, in general, the disadvantages or limitations are similar. Special equipment is required both to produce and show the visuals. This equipment tends to be relatively expensive, and some sort of electrical power is required to operate the projectors. Transportation, maintenance, and storage of equipment and materials require special consideration. If these limitations do not present a problem, projected visuals should be used as much as possible in your extension programs.

Method 1: Motion pictures

Motion pictures are really not "motion" pictures at all. They are a series of still pictures on a long strip of film. Each picture is flashed momentarily on the screen, and the rapid succession of still pictures, each showing the subject in a slightly different position, gives an illusion of movement.

Films have the potential to create powerful emotions and urges, and thus can be a tremendously effective tool in teaching. This means that selected and used properly, they can intensify the interest of an audience in the subject. Films are also excellent for showing the steps necessary in doing a task, or for showing a continuous action.

They can reproduce events long since past. They can record a demonstration that can be shown over and over again to many different people in many different places. They can

slow or accelerate motion for better analysis of action and growth. They can magnify on a screen action that normally would be too small to easily or clearly be seen by an individual or group. They can condense or stretch time. Many other strong points for using motion pictures could be mentioned, but the reasons already given are among the most important and help explain why films are a potent teaching tool.

For motivating an audience, for appealing to the emotions, for a clear and concise portrayal of action, few media approach the motion picture. It portrays reality.

The size of film most commonly used educational motion pictures is 16 mm or other sizes. Films, however, are not alike. Those made for silent viewing or with comments by a leader are made with sprocket holes on both sides of the film. Films made by professional laboratories to which sound is added have sprocket holes on only one side of the film. You should not attempt to project sound film on a silent projector because the teeth of the drive mechanism will punch holes in the sound track. Another difference is that silent films are made to operate at 16 frames per second or somewhat slower than sound film that runs at 24 frames per second. If a silent film is run at the speed for sound, the action will be speeded up.

In selecting a film to use in a given teaching situation, the same judgment must be exercised as in selecting other teaching aids and materials. In addition to the objectives, any previous experience of the audience must be considered, such as age, education, interests, and customs. A film should be used only as a teaching aid. Leaders frequently make the mistake of showing a film without preparing the audience or following up. Because movies sometimes cover too much ground or include too much detail (considering the experience of the audience), viewers often fail to fully understand the ideas presented.

To do the best job, leaders must first be thoroughly familiar with the subject to be taught. Leaders must know exactly how the film supports the ideas to be presented. Before showing the film, leaders should explain the lesson, tell why it is important, and stimulate viewers to look for certain things in the film. When this procedure is followed, the end of the film should be the signal for the beginning of a lively discussion and question period.

A successful film showing depends on looking after a number of details. An adequate power supply that matches the requirements of the projector is necessary. This means checking on details such as extension cords and electrical connections. Some means should be available to darken the room without cutting off ventilation. Spare projection lamps should be on hand. Before the audience arrives, the machine should be set up, threaded with film, focused on the screen, and tested.

The projector should be placed high enough to project over the heads of the audience and the screen high enough from the floor for everyone to see the bottom of the picture easily. A good rule is 1.2 m (4 ft) from the floor to the bottom of the screen.

Method 2: Slides and filmstrips

Slides are one of the most popular and versatile visuals that can be used in extension education. There are two types of slides. The first is referred to a "lantern slide." These were used in very early days and are almost never used today. The lantern slide measured 3 × 4.25" and is mounted in glass. The second, almost universal slide is the 35 mm or 2" (50 × 50 mm) slide. When 35 mm color film is used, a direct color positive transparency is the result. Some types of film can be home-processed, while others require commercial processing. When processed, the film is cut into individual pictures and mounted in cardboard or glass ready for projection.

Filmstrips are visuals that have been photographed on a continuous or strip of film and are projected in a special projector, one image at a time. Filmstrips require specialized production techniques that usually offset production economies for use by extension groups when small amounts of the material are needed. Filmstrips have the same advantages and disadvantages as slides with the exception that image sequences cannot be changed.

Slides and filmstrips have the following advantages.

(1) They can be made by the individual worker at low cost.
(2) They can be made either in natural color or in black and white.
(3) Both the slides and the projection equipment are relatively light and can be easily transported.
(4) Slide sequences can readily be changed to keep them timely and localized.
(5) The length of slide sequences can be changed to fit local needs.

Slides and filmstrips have these limitations.

(1) They do not show action.
(2) They normally require "live" narration, unless synchronized with a tape recorder.
(3) They require close cooperation with a projectionist throughout the presentation if the speaker desires to be in front of an audience, unless remote control equipment is available.
(4) Most importantly, they require a dependable source of main power or generating equipment, and maintenance. A supply of spare projection lamps is a must for the effective utilization of project visuals.

The same attention to meeting room preparation (screen placement, location and set-up of the projector, and room darkening) should be provided for showing slides and filmstrips, as discussed in the section on motion pictures.

Method 3: Overhead transparencies

The overhead projector is nowadays a common visual projection technique. It derives its name from the technique, whereby pictures or illustrations are projected over the head of the presenter.

This medium also has advantages and disadvantages. The most important advantage is that the projector may be used in normal daylight conditions, and presentation rooms do not require darkening. A second factor is that presentation transparencies are easy to prepare. The presenter or an artist/illustrator can draw or write directly on clear or colored acetate sheets using a variety of writing implements.

Wax marking pencils, various types of felt markers, and specially prepared pens with inks that project in color can be used to prepare the subject matter. An overhead projector cannot normally be used to project color transparencies, as 35 mm slides are too small for the projection optics. In addition, the optics are not designed for projection of continuous tones, and work best with lines and solid areas. Full-color transparencies similar to 35 mm slides also require darkened projection conditions. However, overhead projection transparencies can be produced from black and white copy transferred to special films for duplication in office copiers.

Overhead projection is a very versatile medium. Probably the most important factor is that the presenter maintains eye contact with the audience at all times. He or she can use techniques such as progressive disclosure to control the audience. The teacher can point to parts of the transparency for attention. Shapes, such as arrows, cut from cardstock can be used as add-on features to attract attention and emphasize. The presenter can also write directly on the film to add material or emphasize points.

The overhead projector uses electricity for the projection lamp. Its usage then is also linked to a dependable source of main power or a portable generator. Spare lamps are also vital for continued and efficient use.

D. Static media

There is also the static form of media for extension aids. This group of media derives its name from the fact that the material does not involve motion or sound. Examples are posters, flip charts, wall charts, maps, chalkboards (black or colored), magnetic boards, and flannel boards. All of these techniques require the use of some from of printed material. All can be effective when used properly. There are several drawbacks to their use, mainly due to the bulk of the materials which makes transport and storage difficult. Static media are often best used with small or intimate groups for maximum visibility.

Extension workers should keep the following in mind when designing any printed visual. Legibility of a letter is determined by letter height, line width, and letter style. Letter height is most important. A lower-case letter, such as an "e" that is 2.5 cm (1 in) in height is visible from a distance of 10 m (32 ft), a 5 cm (2 in) letter is visible at 20 m (64 ft), and a 1.8 cm (0.5 in) letter is visible at only a distance closer than 5 m (16 ft). Letters should be bold and simple; fancy type styles should be avoided.

When using static visuals, make sure they are displayed prominently and are well-lit, so that members of your audience can see them clearly. Make sure they are secure, so that you are not embarrassed by materials falling to the floor.

Method 1: Posters

A poster is a sheet of paper or cardboard with an illustration and, usually, a few simple words. It is designed to catch the attention of the passerby, emphasize a fact or an idea, and stimulate him or her either to support an idea, to obtain more information, or take some kind of action. People do not walk around studying posters. They look at posters in the same way as they look at trees, birds, houses, cows, or other people. A brief glance is usually as much as the average person gives an ordinary object, long enough only to identify it. If something about the object catches the attention or stimulates interest, the passerby will look at it longer. The design and use of posters as visuals in extension teaching are based on this principle.

Since a single glance may be all that any poster receives, the message must be simple and clear. Details and wordy sentences have no place here. A few suggestions for designing more attractive, effective posters are given below.

(1) Decide exactly who the audience is. Decide exactly what the poster must tell them. Decide what the audience should do.

(2) Put down on a sheet of paper words and rough pictures that express the message simply and clearly.

(3) Try to put the message into a few words, a concise, striking slogan. Visualize or picture the most important central idea in the message. Remember that words and pictures must be seen at a glance and must stimulate a response from the viewer.

(4) Rough out the poster in small scale, 1/3 or 1/4 actual size. If the services of an artist are available, he or she can produce an excellent finished poster from an original rough sketch.

(5) Use plain, bold lettering and lines. Use color to attract attention and for contrast (but remember that too many colors may cause confusion). Allow plenty of space, and do not crowd letters, words, or illustrations.

Posters should supplement, not replace, other communication methods. They are often used to "spearhead" or introduce a campaign, or they may be used to reinforce an

educational effort after it has been launched. In general, the greater the number of posters used in an area, the greater the impact, up to a certain point. Most people find it annoying to be bombarded at every turn by the same poster. Overuse of posters defeats their purpose and may actually turn people against the idea you are trying to get across. Discretion and good taste will suggest the number to use in a given situation.

Posters may be produced in quantity by letterpress, by offset printing, or by silk screening. Where only a small number is required, they may be produced by the individual, by an artist, or by other people such as schoolchildren. Posters are put up on walls of buildings, fences, trees, poles, bulletin boards, store windows, trucks, automobiles, and any other places where they are likely to be seen by people passing by.

Method 2: Exhibits and displays

Exhibits and displays have some of the same characteristics as posters, covered in the preceding section. The main differences are that exhibits and displays are usually larger and more detailed.

As with posters, the purpose of an exhibit or display is to catch the attention of passersby, impress on them a fact or an idea, stimulate interest in the subject matter presented, and possibly urge them to take some sort of action. Differing from a poster, however, the exhibit is larger, may have three dimensions and, most importantly, imparts more-detailed information than is possible with a poster.

Because of their larger size and because they are usually placed in a marketplace or other areas where people move slowly, exhibits and displays attract and hold attention for longer periods than posters. Even so, the periods are not long. The viewing time will depend on whether the exhibit is in an open area or in a separate enclosed room. Viewing time for an audience may be as short as 1 minute or as long as 10 minutes. On average, one should aim at telling the complete story in about 3 minutes. This means that whatever you can do to increase the attention-catching power of your exhibit increases its attractiveness and personal appeal, but keeps its content simple and clear. Doing these increases of the chances, the viewer will receive and understand your message. Again, as is true of all other visuals, planning is the first step in preparing exhibits and displays.

Decide who the audience is, what the message is, and what you want the audience to do. Answering these questions will help to plan the scope of the exhibit, the type of appeal to use, and the content. The most-effective exhibits are built around a single idea with a minimum of supporting information, in a few simple words and pictures, to tell farmers that a new seed variety is better and why, that is all.

Make a miniature of the exhibit from paper or cardboard. This will help visualize it at full scale. Experiment with colors and designs, and an artist's help in planning the arrangement would be helpful.

To attract attention and get people to stop and look at the exhibit, something that catches the eye should be included. This might be a live object, such as a sheep in an exhibit about sheep, or it might be color, movement, light, or any number of things suggested by a lively imagination.

One can try to define the "something" that causes people to stop and look for more detailed information. This "something" must produce a "mental shock". Once a person stops in front of an exhibit, he or she is susceptible to the rest of the message or messages in the exhibit. Incidentally, a walking person passes by an exhibit in about the same number of seconds as there are lineal feet in front of the booth. In other words if the booth is 10 ft (3 m) wide in front, a person has about 10 seconds to absorb enough of the intended message to be persuaded to stop and discover the rest. Thus it is obvious that the attention of passersby must be attracted in a very short time.

Make sure that the central idea of the exhibit stands out. The lesson taught must immediately be clear. A combination of real objects, models, or illustrative material plus a bold sign will usually get the point across.

Folk Media

Interest in the use of folk media is increasing in many less-industrialized countries. These media include theatre plays, songs, puppet shows, storytellers, and other traditional forms of entertainment.

It has been suggested that interest in folk media has increased because mass media have been less successful in promoting rural development than was expected. Alternative means of communication with rural people have therefore been sought. Another reason is that there has been a decreased emphasis on top-down communication with rural people in favor of participatory approaches. Folk media usually involve substantial participation.

These media often appeal to the emotions of members of the audience who identify themselves with the players. It is easier for them to identify with folk media because these fit closely with local cultural patterns, whereas the mass media bring information from urban centers and from foreign countries. Hence, folk media are often more effective at arousing motivation to change than in transferring knowledge to villagers about how to change. Furthermore, the audience tends to have confidence in the message because communication

takes place in a form they are accustomed to, in their dialect, and often from people they know. It might be acceptable for players to ridicule people who prefer to stick to the old ways, whereas it would be unacceptable for a government extension agent to do so.

Extension organizations can stimulate participation by arranging competitions for the best plays.

This appears to be a relatively inexpensive extension method. Folk and modern media do not have to compete, but can complement each other. Thus, folk media can be shown on television, and folksongs with a development theme can be broadcast on radio. This is often done in some Asian countries, partly because governments see it as a way of promoting national unity. A Brazilian agricultural extension service commissioned a popular folk singer to write and perform folksongs that incorporate technical messages about fertilizer use.

Conclusions

Rural people obtain information from many sources. Research has shown that sources most used by farmers vary with the stages described in the introduction chapter on the adoption or diffusion process. These studies indicate that mass media are most important in attracting awareness and interest. Friends and neighbors are first in importance in the evaluation, trial, and adoption stages. The second rank of important sources is friends and neighbors for awareness and interest, while it is government agencies (including extension workers) for the other three stages.

Government agencies come in third place in securing awareness and interest. In addition to extension workers, sources include vocational teachers of agricultural and home economics, soil conservation service, and other agencies of the agricultural ministry and local governments. Dealers and salesmen are acknowledged, but they take [fourth?] place in importance. A very significant finding in this research is the extent to which farmers say they rely on friends and neighbors at all stages in the diffusion of knowledge.

Many factors enter into the selection of suitable extension methods. Strictly speaking, what we call methods are often tools that we may apply in different ways. Basically, individual contact methods furnish the most-direct opportunities for influencing people. All other tools of group and mass procedures are dilutions or compromises created by the pressure of necessity. Extension workers must reach more people, reach them more often, and keep down the cost per contact. As more contacts are better than any single method, our concerns should be directed to the following points: (1) what all the tools are, (2) what each has to contribute, and (3) what the best combination of personal, group, and mass media is for a

specific plan of work or educational campaign.

Other considerations related to the selection of suitable technology transfer methods are:

(1) The length of time the program has been under way in an area;
(2) The character and stage of development of the program, for example results demonstrations may no longer need to provide the proof of recommended practices;
(3) The personality and skills of available workers both paid and volunteer;
(4) The gender, age, education, motives, and other complex human characteristics and customs of the people to be reached;
(5) General local conditions, such as seasonal work, weather conditions, available meeting places, organization, and leadership; and
(6) Financial and other resources, such as equipment, including returns per unit of time spent on the method.

This list is incomplete. It is only suggestive of the many items which may be considered in choosing the “kit of tools” to be used. These tools should be flexible and capable of easy adaptation to changing conditions. It is important to use the right methods and tools in the right proportions at the right time.

Modern information technology can give farmers rapid access to a large amount of information, help them select exactly what information from this they need for their decision-making, and with the assistance of decision-making models, guide their decision-making processes. Modern computers have become much more user-friendly. Previously, the mass media gave generalized advice to farmers, but with modern information technology, extension services can provide advice custom-tailored to each farm and farmer without visiting the farm personally. This makes it possible to combine some of the advantages of mass media with those of farm visits. The methodology for technology transfer in the 21st century will undergo many changes, but the deliverer of technology and/or relevant information that embraces the challenges with an innovative and imaginative eye will profit from pioneering efforts in the use of new global or local delivery systems. In the Information Age, the saying, "survival of the smartest" will undoubtedly take precedent over "survival of the fittest".

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